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**west virginia** department of environmental protection

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## **ENGINEERING EVALUATION / FACT SHEET**

### **BACKGROUND INFORMATION**

Application No.:	R13-2392C
Plant ID No.:	025-00011
Applicant:	CSX Hotels, Inc., The Greenbrier
Facility Name:	White Sulphur Springs
Location:	White Sulphur Springs, Greenbrier County
SIC Code:	7011 Hotels and Motels
Application Type:	Modification
Received Date:	November 11, 2010
Engineer Assigned:	David Keatley
Fee Amount:	\$1000
Date Fee Received:	November 29, 2010
Complete Date:	May 5, 2011
Due Date:	August 3, 2011
Applicant Ad Date:	November 23, 2010
Newspaper:	<i>The West Virginia Daily News</i>
UTM's:	Easting: 560.95 km      Northing: 4,182.31 km      Zone: 17
Description:	The applicant has installed a diesel-fired after-the-fact 1,400 hp generator.

### **DESCRIPTION OF PROCESS**

This facility consists of five (5) boilers and eight (8) emergency generators. This permit accounts for one (1) after-the-fact emergency generator. The generators are used to provide emergency power in the event commercial power is lost. The boilers are used to provide hot water to meet the heating load for the facility. This facility is a synthetic minor for NO<sub>x</sub> and SO<sub>2</sub>.

### **SITE INSPECTION**

On June 2, 2010 John Moneypenny from the Compliance and Enforcement section performed a full onsite inspection of this facility.

Directions: From Charleston take I64 E until exit #175 (White Sulphur Springs). Turn left onto Hart's Run Rd. (CR60/14) and then turn right onto US60 E. Travel on US60

for about 3.2 miles and take left into The Greenbrier Resort Hotel Main Entrance.

### ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions calculations (except for SO<sub>2</sub>) for B-4, B5, G1, G2, G3, G4, G5, G6, and G7 were performed by the permit writer using AP-42.

Source ID	Emission Source	Pollutant	Maximum Hourly Emissions (lb/hr)	Maximum Annual Emissions (tpy)
B-1	Boiler 1 Nebraska Model NS-C-47 43.0 mmBTU/hr (gas) 40.9 mmBTU/hr	Nitrogen Oxides	6.1	15
		Carbon Monoxide	3.4	15.03
		Volatile Organic Compounds	0.3	1.07
		Sulfur Dioxide	21.7	11.93
		Total Particulate Matter	2.9	4.87
		Formaldehyde	0.03	0.04
B-2	Boiler 2 Nebraska Model NS-C-47 43.0 mmBTU/hr (gas) 40.9 mmBTU/hr	Nitrogen Oxides	6.1	15
		Carbon Monoxide	3.4	15.03
		Volatile Organic Compounds	0.3	1.07
		Sulfur Dioxide	21.7	11.93
		Total Particulate Matter	2.9	4.87
		Formaldehyde	0.03	0.04
B-3	Boiler 3 Nebraska Model NS-C-47 43.0 mmBTU/hr (gas) 40.9 mmBTU/hr	Nitrogen Oxides	6.1	15
		Carbon Monoxide	3.4	15.03
		Volatile Organic Compounds	0.3	1.07
		Sulfur Dioxide	21.7	11.93
		Total Particulate Matter	2.9	4.87
		Formaldehyde	0.03	0.04
B-4	PVI Bunker Boiler 4 6.925 mmBTU/hr (gas)	Nitrogen Oxides	0.71	3.11
		Carbon Monoxide	0.60	2.63
		Volatile Organic Compounds	0.04	0.18
		Sulfur Dioxide	3.94	17.24
		Total Particulate Matter	0.02	0.09
B-5	PVI Bunker Boiler 4 6.925 mmBTU/hr (gas)	Nitrogen Oxides	0.71	3.11
		Carbon Monoxide	0.60	2.63
		Volatile Organic Compounds	0.04	0.18
		Sulfur Dioxide	3.94	17.24
		Total Particulate Matter	0.02	0.09
G1	Bunker Generator 1 960 hp	Nitrogen Oxides	23.04	5.76
		Carbon Monoxide	5.28	1.32
		Volatile Organic Compounds	0.68	0.17
		Sulfur Dioxide	6.96	1.74

		Total Particulate Matter	0.672	0.17
G2	Bunker Generator 2 960 hp	Nitrogen Oxides	23.04	5.76
		Carbon Monoxide	5.28	1.32
		Volatile Organic Compounds	0.68	0.17
		Sulfur Dioxide	6.96	1.74
		Total Particulate Matter	0.672	0.17
G3	Bunker Generator 3 960 hp	Nitrogen Oxides	23.04	5.76
		Carbon Monoxide	5.28	1.32
		Volatile Organic Compounds	0.68	0.17
		Sulfur Dioxide	6.96	1.74
		Total Particulate Matter	0.672	0.17
G4	Generator Boiler Room 4 382 hp	Nitrogen Oxides	4.21	1.06
		Carbon Monoxide	2.66	0.67
		Volatile Organic Compounds	5.73	1.44
		Sulfur Dioxide	0.54	0.14
		Total Particulate Matter	0.28	0.07
G5	Security Generator 5 33.5 hp	Nitrogen Oxides	0.37	0.10
		Carbon Monoxide	0.24	0.06
		Volatile Organic Compounds	0.51	0.13
		Sulfur Dioxide	0.03	0.01
		Total Particulate Matter	0.03	0.01
G6	Security Room Generator 6 382 hp	Nitrogen Oxides	4.21	1.06
		Carbon Monoxide	2.66	0.67
		Volatile Organic Compounds	5.73	1.44
		Sulfur Dioxide	0.54	0.14
		Total Particulate Matter	0.28	0.07
G7	Transformer Room Generator 6 896 hp	Nitrogen Oxides	21.51	5.38
		Carbon Monoxide	4.93	1.24
		Volatile Organic Compounds	0.64	0.16
		Sulfur Dioxide	2.03	0.51
		Total Particulate Matter	0.63	0.16
G8	Casino Generator 8 1400 hp	Nitrogen Oxides	14.57	3.64
		Carbon Monoxide	0.384	0.096
		Volatile Organic Compounds	0.0296	0.0074
		Sulfur Dioxide	3.86	0.965
		Total Particulate Matter	0.0532	0.0133

## REGULATORY APPLICABILITY

### **45CSR2** *To Prevent and Control Particulate Air Pollution From Combustion of Fuel in Indirect Heat Exchangers*

The boilers at this facility meets the definition for fuel burning unit (section 2.10). B-4 and B-5 has a 6.925 MMBTU design heat input, which is below the 10 MMBTU threshold and is exempt from sections 4, 5, 6, 8 and 9. All boilers are subject to a

10% opacity limit. To demonstrate compliance this facility will perform monthly opacity monitoring for each of the boilers.

**45CSR2A**      *Testing, Monitoring, Recordkeeping and Reporting Requirements Under 45CSR2*

B-1, B-2, and B-3 have a design heat input greater than 10 MMBTU/hr and are subject to this rule. When combusting natural gas this facility shall record date and time of start-up and shutdown, and quantity of fuel consumed on a daily basis (section 7.1.a.1). When combusting #2 Fuel Oil this facility will record everything that is required for natural gas and a BTU analysis for each shipment (section 7.1.a.2).

**45CSR4**      *To Prevent and Control the Discharge of Air Pollutants Into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors*

The facility is subject to the requirements of 45CSR4 and shall not allow the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.

**45CSR10**      *To Prevent and Control Air Pollution From the Emission of Sulfur Oxides*

B-4 and B-5 has a 6.925 MMBTU heat capacity rate, which is below the 10 MMBTU threshold and therefore B-4 and B-5 are exempt from sections 3, 6, 7, and 8. This facility is in Greenbrier County and is in Priority Classification III. The total design heat capacity for this facility is 143 MMBTU/hr. The maximum allowable emission of SO<sub>2</sub> according to this rule is 457.6 lb/hr. This facilities emission limits are well below this threshold.

**45CSR13**      *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits, and Procedures for Evaluation*

The source is subject to the requirements of 45CSR13 because it has an uncontrolled potential to discharge greater than (6) pounds per hour and ten (10) tons per year of many regulated air pollutants.

**45CSR16** - *Standards of Performance for New Stationary Sources*

Since this source is subject to 40CFR60 Subpart Dc it is subject to this rule.

**45CSR22**      *Air Quality Management Fee Program*

This source is subject to this rule due to the required Modification application fee and the annual operating fee.

## **45CSR30**      *Requirements for Operating Permits*

The Greenbrier's boilers are subject to 40CFR60 Subpart Dc, and are therefore subject to 45CSR30 as a deferred source. The Greenbrier will be required to keep their Certificate to Operate current.

## **40CFR60 Subpart Dc**      *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*

For a boiler to be subject to this regulation it has to be constructed, modified, or reconstructed after June 9, 1989 and has a maximum design capacity of less than 100 MMBTU/hr and more than 10 MMBTU/hr. Two boilers are less than 10 MMBTU/hr (B-4 and B-5), the other three boilers (B-1, B-2, and B-3) at this facility meet these criteria, making them subject to Subpart Dc. Subpart Dc has requirements for both #2 fuel oil (referred in Subpart Dc as Distillate Oil) and natural gas, and has requirements for SO<sub>2</sub> and particulate matter. For #2 fuel oil (FO) Subpart Dc has a recordkeeping requirements for amount and recordkeeping and reporting requirement for sulfur content. For #2 FO the opacity requirement under 60.43c(c) is 20 percent opacity (6-minute average). For natural gas Subpart Dc has an amount recordkeeping requirement.

## **40CFR60 Subpart IIII**      *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*

Emergency generator G8 is subject to Subpart IIII because the engine was manufactured in 2010 and an owner or operator is subject to this subpart. 40CFR89.112 Table 1 provides the allowable emission standards from nonroad compression-ignition engines. G8 is a 1400 hp engine manufactured in 2010 which is a Tier 2 engine and has allowable emissions standards (g/kW-hr) are: NMHC + NO<sub>x</sub> = 6.4, CO = 3.5, and PM = 0.20.

## TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

### Formaldehyde

Formaldehyde is used mainly to produce resins used in particleboard products and as an intermediate in the synthesis of other chemicals. Exposure to formaldehyde may occur by breathing contaminated indoor air, tobacco smoke, or ambient urban air. Acute (short-term) and chronic (long-term) inhalation exposure to formaldehyde in humans can result in respiratory symptoms, and eye, nose, and throat irritation. Limited human studies have reported an association between formaldehyde exposure and lung and nasopharyngeal cancer. Animal inhalation studies have reported an increased incidence of nasal squamous cell cancer. EPA considers formaldehyde a probable human carcinogen (Group B1).

### AIR QUALITY IMPACT ANALYSIS

Based on the annual emissions rates this facility will not be a major source as defined by 45CSR14, so no air quality impact analysis was performed.

### CHANGES TO PERMIT R13-2392B

Installation of a diesel-fired 1,400 hp generator engine.

### RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates CSX Hotels, Inc., The Greenbrier meets all the requirements of applicable rules and regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Greenbrier County location should be granted a 45CSR13 Modification for their facility.

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David Keatley  
Engineer

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Date